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# CONFOUNDING VARIABLES WITHIN "REFERRAL CONTROLS" FOR CHILDREN WITH HISTORIES OF SEXUAL STIMULATION BY ADULTS: IMPLICATIONS FOR ERRONEOUS ATTRIBUTIONS FROM "CHILDHOOD SEXUAL ABUSE"

MICHAEL A. PERSINGER
*Laurentian University, Sudbury, Ontario, Canada*

Verbal and performance scores from a standardized intelligence battery for age-matched children from four groups ($n = 67$) were compared to discern if the depressed scores for verbal intelligence displayed by children with histories of verified sexual stimulation by adults were epiphenomenal. The children had been referred to a psychiatric facility because of early sexual stimulation by adults, from a children's mental health service because of family problems, or from a school board for conduct disorders. The fourth group was hospital controls for the first group. The children with nonculturally approved sexual activity with adults and those from the mental health service displayed verbal intelligence scores that were about one *SD* below the scores for children referred by the school board and for the control group. These results suggest that psychological variables may not reflect a causal relationship and hence group differences should not be attributed exclusively to the diagnosis of sexual abuse.

*Keywords:* sexual abuse, intelligence, confounding variables, post-hoc attribution, children.

The cause of statistically significant differences between diagnostic groups for various criterion measures or clusters of measures is often attributed to the etiologies that define the diagnosis. Such conclusions are not necessarily valid. An analogous problem emerged when the beneficial effects of transcendental meditation were attributed to the mantra (Persinger, Carrey, & Suess, 1980) although the actual stimulus source was the nonspecific repetition of any

Professor Michael A. Persinger, Departments of Psychology and Biology, Laurentian University, Sudbury Ontario, Canada.
Appreciation is due to anonymous reviewers.
Please send correspondence and reprint requests to: Dr. M. A. Persinger, Clinical Neuropsychology Laboratory, Department of Psychology, Laurentian University, Sudbury, Ontario, Canada P3E 2C6. Phone: +1 705-675-4824; Fax: +1 705-671-3844; Email:**mpersinger@laurentian.ca**

sound (Bensen, 1975). However, many clinicians still conclude implicitly that differences between diagnostic groups are due to their presumed etiology (Einbender & Friedrich, 1989; Green, 1983; Salzinger, Kaplan, Pelcovitz, Samit, & Krieger, 1984) rather than the differences existing a priori that increase the vulnerability to the diagnosis or the conditions that result in the diagnosis.

Post hoc attribution of cause from diagnostic labels is often based upon restricted evidence and consensually based criteria of causality. These principles have been employed to demonstrate the causal connection between tobacco usage and cancer (Vineis et al., 2004), and involve consideration of confounding variables that could explain the observed association, dose response relationships, biological plausibility, and consistency of findings. However, if the attribution is perfused with belief, particularly from moral panics, social constructions of deviant behavior (Victor, 1998), or implicit extensions of religious beliefs (Stevens, 1992), inferences and conclusions about these causal variables can be reliable but not valid.

The problem is very conspicuous within studies that attempt to establish the effects upon children of early sexual stimulation by adults within a context that is not compatible with Western 20th century mores. Although correlation does not prove causation, this important fact can be obscured when a belief spreads through society (Lynch, 1996). For example, according to Freyd et al. (2005) child sexual abuse is associated (correlated) with serious mental and physical health problems, substance abuse, victimization, and criminality in adulthood.

The specific mental health problems attributed to sexual abuse include posttraumatic stress disorder, depression, and suicide. Even adult obesity and career failure in females have been attributed to a singular sexual trauma. Freyd et al. (2005, p. 501) have also stated that child sexual abuse has been "used as a weapon of war and genocide and is associated with abduction and human trafficking". Such beliefs have been spread abroad as facts within North American society by means of vituperative testimonials and acrimonious rhetoric (e.g., Bass & Davis, 1988).

Although the classification *sexual abuse* has been applied to children who have sustained sexual activity with adults and these behaviors towards children by adults should be considered inappropriate and not lawful for a variety of aesthetic and ethical reasons within Western culture, the label does not reveal any causal connection between the activity that is defined as abuse and the subsequent cognitive development of the child. There have been frequent failures by professionals, whose behaviors, licenses, and incomes are controlled by legal definitions, to establish with thorough investigation if there were actual nonspecific factors that resulted in the referral that may have confounded the diagnostic label. These epiphenomena can be confused further if there is additional focus upon the level of statistical significance rather than upon the

effect size for the group differences. Effect size – in this instance eta-squared – is defined as the amount of variance in the dependent variable accommodated by the subject's affiliation with a designated group.

Carrey, Butter, Persinger, and Bialik (1995) have reported that a group of children whose repeated sexual interaction with adults had been verified, were discriminated (86% correct classification) significantly from a group of clinical, age-matched controls. Although there was great effort to accommodate socioeconomic, gender and family factors, the requirement for multiple comparator groups was ignored and when these data were included within the original manuscript they were rejected by anonymous referees, the reason given for this being that "everyone knows that sexual abuse causes cognitive deficits". Any science without comparator controls to address the effect size of the ostensible phenomenon and without references to absolute baselines remains qualitative and hence subject to the effects of confounding variables. The present post hoc study was designed to address the methodological problems that were evident in the report by Carrey et al. (1995).

## METHOD

The standardized subtest scores from the Wechsler Intelligence Scale for Children-Revised (WISC-R) of the reference ($n = 19$) and abused ($n = 17$) patients from the Carrey et al. (1995) study were appended to a database containing age-matched children (7 years through to 13 years of age) who had been referred for neuropsychological assessments from a local children's mental health center ($n = 17$) because of family problems or from a local school board ($n = 14$) because of conduct disorders. Eleven of the 17 children who were referred from the children's center for neuropsychological assessment had sustained a mechanical trauma to the head that was sufficient to have induced unconsciousness. Nine of the 14 children who had been referred from the school board had sustained head traumas of comparable magnitudes with loss of consciousness.

The means and standard deviations for the average $z$ score (from age-specific normative data) for 11 major neuropsychological procedures (average finger agnosia, both hands), Category Test, Tactual Performance Test: dominant and nondominant hand; Finger Tap: dominant and nondominant hand; Foot Tap: dominant and nondominant foot; Rey Figure: copy and recall after 30 min), and Auditory Closure were -0.7 (0.7) [range = -2.7 to +0.7] for the referrals from the mental health center and -0.5 (0.7) [range = -2.1 to +0.9] for the referrals from the school board. The average general neuropsychological impairment did not differ significantly [$F(1,29) < 1.00$, $p > .05$] between these two groups.

The data from these two groups ($n = 31$) were collected over a three-year period that corresponded with the Carrey et al. (1995) sample. There was no

documentation or even the hint of reference to sexual indiscretion or physical force (defined as spankings resulting in bruising or welting) within the records of these children from either the mental health or school board files. Structured interviews with the parents of 29 of the 31 children also indicated no direct or indirect evidence of sexual stimulation or excessive physical force. The proportions of girls and boys were comparable in all four groups. The means and standard deviations for the subtests and the general clusters (verbal and performance) for the four groups are shown in Table 1. Because of the statistical problems that often emerge with multiple one-way analyses of variance, factor analyses were completed in order to extract the shared source of variance and to prevent inclusion of redundant sources of variance.

## RESULTS

Factor analyses (PA1 method) of the 11 subtest scores for the 67 children yielded the three factors (accommodating 66% of the variance) the structures of which were very similar to those described by Kaufman (1979). For each factor the significant ($r > 0.50$) loadings for the variables after varimax rotation were: Factor 1 (eigen value = 4.38, 40% of the variance) Information (0.65), Similarities (0.70), Vocabulary (0.87), and Comprehension (0.84); Factor 2 (eigen value = 1.76, 16% of variance) Arithmetic (0.74), Digit Span (0.74), Coding (0.82), and Block Design (0.67); Factor 3 (eigenvalue = 1.14; 10% variance) Picture Completion (0.66), Picture Arrangement (0.73), Block Design (0.50), and Object Assembly (0.59).

**TABLE 1**
**MEANS AND STANDARD DEVIATIONS FOR THE VARIOUS STANDARDIZED SCORES OF THE WISC-R FOR THE FOUR REFERRAL GROUPS**

| | Controls | | Sexual Stimulation | | MHC | | SBR | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| **Test** | | | | | | | | |
| Information | 9.1 | 1.9 | 7.2 | 1.7 | 6.8 | 2.9 | 7.8 | 3.0 |
| Similarities | 10.6 | 2.1 | 7.6 | 2.1 | 8.8 | 3.9 | 10.8 | 2.0 |
| Arithmetic | 10.2 | 2.2 | 7.6 | 2.4 | 5.7 | 2.6 | 8.2 | 2.8 |
| Vocabulary | 9.0 | 2.1 | 6.5 | 1.9 | 7.6 | 2.9 | 9.0 | 2.7 |
| Comprehension | 8.1 | 1.3 | 6.4 | 1.9 | 7.3 | 3.2 | 9.2 | 2.9 |
| Digit Span | 13.1 | 3.5 | 10.3 | 3.2 | 6.0 | 2.6 | 7.7 | 1.9 |
| Verbal IQ | 96.4 | 7.9 | 81.6 | 7.4 | 82.9 | 15.0 | 93.4 | 14.6 |
| Picture completion | 10.8 | 2.1 | 9.8 | 2.7 | 12.0 | 3.1 | 11.6 | 2.9 |
| Picture arrangement | 10.7 | 1.6 | 10.4 | 2.9 | 9.7 | 2.3 | 10.9 | 2.6 |
| Block design | 11.0 | 2.4 | 10.8 | 2.5 | 9.1 | 4.0 | 9.6 | 3.6 |
| Object assembly | 11.5 | 3.7 | 10.3 | 2.4 | 10.2 | 2.5 | 11.4 | 3.1 |
| Coding | 10.9 | 8.7 | 8.7 | 3.1 | 6.8 | 2.6 | 8.4 | 3.5 |

*Table 1 continued*

| | Controls | | Sexual Stimulation | | MHC | | SBR | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Mazes | 13.2 | 4.2 | 12.2 | 4.4 | 9.9 | 3.1 | 9.4 | 3.0 |
| Performance intelligence | 107.3 | 9.2 | 100.0 | 13.2 | 97.1 | 14.4 | 102.5 | 15.2 |

*Note:* The groups (*n* in Parentheses) were Hospital Controls (*n* = 19), Sexually Stimulated (*n* = 17), Children's Mental Health Clinic Referrals for Family Problems (*n* = 17), and School Board Referrals for Conduct Disorders (*n* = 14).

**TABLE 2**
**FACTOR (*Z*) SCORES FROM COGNITIVE SUBTESTS FOR CHILDREN FROM FOUR GROUPS**

| | Controls | | Sexual Stimulation | | MHC | | SBR | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Verbal IQ | .41 | .58[a] | -.62 | .67[b] | -.20 | 1.20 | .45 | 1.11[a] |
| Performance intelligence | -.22 | .61 | -.18 | 1.09 | .20 | 1.12 | .28 | 1.10 |
| Third Factor | .81 | .72[a] | .26 | .81[a] | -.87 | .76[b] | -.37 | .79[b] |

*Notes:* [a] vs [b] = $p < .05$
The Groups (*n* in Parentheses) were Hospital Controls (*n* = 19), Sexually Stimulated (*n* = 17), Children's Mental Health Clinic Referrals for Family Problems (*n* = 17), and School Board Referrals for "Conduct" Disorders (*n* = 14)

The results of the one-way analyses of variance for the three factors as a function of the four groups are shown in Table 2. There were statistically significant differences between the groups for the verbal factor [$F(3,63) = 5.22$, $p < .01$; eta-squared = 21% of variance explained) and the third factor [$F(3,63) = 15.98$, $p < .001$; eta-squared = 43% of variance explained] but not for the performance factor [$F = 1.28$, $p > .05$]. Post hoc analyses (Tukey's set at $p < .05$) demonstrated that the primary source of the group differences for the verbal factor was the lower scores for the sexually stimulated group defined in the Carrey et al. (1995) study and the children referred for family problems compared to the Carrey et al. control group and the children referred from the school board for conduct problems. The major source of the group differences for the third freedom from distractibility factor was the lower scores for the two additional referral groups compared to the sexually stimulated and control groups from the Carrey et al. (1995) study.

## DISCUSSION

The results of the present study indicated that a difference of about one standard deviation in verbal intelligence was not specific to children who had been referred because of protracted sexual stimulation by adults but was also

evident in children who had been referred for neuropsychological assessments from a mental health service because the parents were having difficulties controlling their children. As a group these children, who had sustained head traumas and for whom there was no reported history of early sexual stimulation, did not display neuropsychological impairments. Their scores for the neuropsychological assessments did not differ significantly from the group who had been referred from a school board because of conduct disorders.

These results also underline the danger of attributing differences between clinical and control groups to the conditions – in this case, sexual abuse – that resulted in the referral. There may be nonspecific factors common to children who exhibit a depressed verbal intelligence that increase their risk of engaging in or becoming stimuli for large numbers of social interactions that exceed the expectations or mores of the society. These factors may range from less than optimal relationships between parents and children as displayed by the group referred from the mental health center to behaviors considered to be inferences of sexual abuse. Similar problems have been found when comparing the personalities of women who sustained a closed head injury from a motor vehicle incident with the personalities of women who reported physical assault or sexual harassment (Dubois & Persinger, 1996).

The application of criteria of causality for epidemiological data is based upon absence of confounding variables, strength of association, dose-response relationships, biologic plausibility, and consistency of interobservor findings. Arguments for possible causality between variables, at least in the physical sciences, require approximately 90% ($r = 0.95$) of the variance to be explained if the remaining 10% of the variance is assumed to be measurement error. From an absolute perspective, this means that the different histories of the groups in the present study explained no more than about 25% of the variability in verbal intelligence. This is not sufficient to constitute a causal relationship.

Except for the involvement of intense or repeated nociceptive stimulation (causing pain) of tissue or its damage, there is minimal biological plausibility to the assumption that premature activation of a small subset of cells that comprise genital tissue produces long-term deficits in behavior or cognitive capacity. Although pejorative phrases such as "violation of trust" or "imbalance of power" to explain the alleged consequences of sexual abuse have dramatic appeal, they have minimum validity and are very difficult to translate into realistic, testable operational definitions. A meta-analytic examination involving 59 studies showed that university students with histories of sexual abuse as children were no less well-adjusted in adulthood than controls when confounding variables were controlled (Rind, Tromovitch, & Bauserman, 1998). Self-reported reactions to and the effects of early stimulation were neither pervasive nor typically intense.

However, there is significant evidence that the labels given to the experience by society and its post hoc responses and attributions to the events can affect the person's reconstructions of the experience, beliefs, attitudes, and psychological stability (e.g., Dittburner & Persinger, 1993; O'Gorman & Persinger, 1998; Persinger, 1992). Mandatory treatment of people who were sexually stimulated as children by clinicians who believe these behaviors are the cause of all difficulties would be expected to produce an epidemic of iatrogenic populations with long-term deficits. Because belief systems or moral panics (Stevens, 1992; Victor, 1998) that emphasize counterintuitive reasoning (Pyysiainen, Lindeman, & Honkela, 2003) can occur within an entire population, consistency of conclusions by multiple researchers does not necessarily imply validity any more than does the intercultural consistency of attributing strange lights in the sky to extraterrestrial intelligence. Neither reliability nor consensus is synonymous with validity.

There are powerful consequences from ignoring the acceptance by default of the truth of such flawed attributions. Social mores and the legal systems that maintain their implementation through punishment and incarceration are based upon the popular consensus of beliefs rather than scientific method or the objective assessment of data. Once instituted into regulatory bodies as fact, objective challenge by scientific method is deprecated and individuals with the temerity to discuss the problem in public forums are disparaged as disingenuous with histories arousing suspicion. As a result, academic freedom and open inquiry, the essential requirements to pursue validity, are sequestered.

In the present study obvious artifacts, due to anomalous properties of the four groups, are not likely. There were no statistically significant differences between the four groups for the scores for performance intelligence. The similarities of this general score suggested all groups had been learning new information at comparable rates. In summary, these results indicate that multiple etiologies can produce convergent symptoms. However, the presence of these symptoms cannot be employed to specify the cause. To do so would be similar to observing that 90% of all murderers drive white cars and then concluding that 90% of all people who drive white cars are murderers.

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